

Summary

Designing Emotions

Emotions enrich virtually all of our waking moments with either a pleasant or an unpleasant quality. Given the fact that a substantial part of these day-to-day emotions is elicited by cultural products, such as art, clothing, and consumer products, designers may find it important to include emotions in the intentions of their design efforts. In addition, emotional responses can induce customers to pick a particular model out of the row, and might therefore have a considerable influence on our purchase decisions. As a consequence, more and more producers nowadays challenge designers to manipulate the emotional impact of their designs. In design practice however, emotions elicited by products are often considered to be intangible and therefore impossible to manipulate. For that reason, this thesis is concerned with the relationship between product design and evoked emotions. The research focus is on emotions elicited specifically by product *appearance*. The author's major claim is that because these emotions are not as intangible as they seem, designers *can* influence the emotional impact of their designs.

The thesis is structured in three parts, of which each focuses on a particular aspect of product emotions. In Part A, emotions and product emotions are described and defined. Next, Part B reports the development, validation, and application of an instrument to measure product emotions. Part C reports the development and application of an instrument that assists designers in 'designing emotions.' In the general discussion, it is discussed how the tools can be integrated and applied in design practice.

Part A: defining product emotions

Chapter 1 examines current perspectives in psychology, defines the phenomenon 'emotion,' and discusses its nature. Emotions are distinguished from other types of affective states, such as moods and sentiments, and various approaches often employed to differentiate between emotions are discussed. The main conclusion is that product emotions are not a special type of emotions, but are as 'real' as, and have the same qualities as the emotions we experience in our social interaction. A quality shared by all emotions is that they always imply and involve a relation between the person who experiences them and a particular object. That object is not necessarily the product itself, but can also be some associated object, event, or person. One can, for instance, be *fascinated* by an innovative new bicycle concept (the object is the bicycle itself), or be *inspired* by the sight of a backpack because it reminds them of an exciting hiking expedition (the object is the associated memory).

The second chapter focuses on the question which emotions are (and which are not) generally experienced in response to product appearance. Emotions that are experienced often (e.g. *satisfaction*) are considered to be more relevant than those that are experienced only rarely (e.g. *rage*). A series of three studies is reported, which was performed to assemble a set of 41 emotions that represents a manageable overview of 'product relevant emotions' (see Figure 2-7). Typical to the set is that it includes many 'evolved' emotions (e.g. *boredom*, *inspiration*, and *amusement*), that is, emotions that require more cognitive processing than basic 'survival' emotions such as *fear* and *anger*.

Part B: measuring product emotions

The second part of the thesis focuses on the question of how to measure product emotions. Chapter 3 reviews existing instruments and reports the development of the Product Emotion measurement instrument (PrEmo). PrEmo is a non-verbal self-report instrument that measures 14 (product relevant) emotions. Instead of relying on the use of words, respondents can report their emotions with the use of a set of expressive cartoon animations. Each animation portrays an emotion by means of dynamic facial, bodily, and vocal expressions (see Figure 3-11). The unique strength of PrEmo is that it combines two qualities: it measures *distinct* emotions and it can be used *cross-culturally*. In addition, it can be used to measure mixed emotions, that is, more than one emotion experienced simultaneously, and the operation requires neither extensive equipment nor technical expertise.

Chapter 4 reports the validation of both the animations and the instrument. Given the requirement of cross-cultural application possibilities, the PrEmo animations were validated in various countries (i.e. The Netherlands, Japan, Finland, and the USA). All animations were found to be reliable. Although valid in The Netherlands, the USA and Finland, two animations were found to be invalid in Japan (i.e. *desire* and *disappointment*). An explorative study with Japanese actors is reported that was used to determine how these animations should be adjusted to ensure validity in Japan. Next, Study 7 was performed to assess the validity of the instrument. In this study, emotions elicited by six chairs were measured both with PrEmo and with verbal rating scales. The results obtained with PrEmo showed a remarkable high agreement with those obtained by way of verbal rating scales, indicating convergent validity. In addition, respondents agreed that the set of 14 animations was sufficient to adequately report their emotions. Moreover, the animations were found to be more intuitive and enjoyable to use than the verbal scales. Based on these findings, it was concluded that PrEmo adequately enables the researcher to study the relationship between product design and emotional responses.

Chapter 5 reports Study 8, which was performed to explore PrEmo's cross-cultural application possibilities. Emotions elicited by six car models were measured both in Japan and in The Netherlands, and visualised in a 'product & emotion space' (see Figure 5-2). The study demonstrated that PrEmo enables the researcher to differentiate product designs on the basis of the consumers' emotional responses. With the results, for each car model an 'emotion profile' was drawn up. These profiles showed significant between-car differences and indicated that the cars elicit 'mixed emotions,' which in some cases even included both pleasant and unpleasant emotions simultaneously.

Although it was expected to find relationships between emotions, age and gender, it was found that neither age nor gender could be used to explain variance in the respondents' emotional responses. Culture on the other hand, was found to produce a significant effect on these responses. On the basis of the measured responses, respondents were clustered in three 'affect-groups.' Particularly eye-catching was that one affect-group was composed only of Japanese respondents. Apparently, a group of Japanese people exists that does not have a Dutch equivalent with respect to experienced emotions.

Part C: designing product emotions

People differ with respect to their emotional responses towards a given product. Nevertheless, in spite of these interpersonal differences, the process of emotions, that is, the way in which emotions are elicited, is universal. Chapter 6 reports a general model of product emotions that sets forth three main parameters that determine if a product elicits an emotion, and if so, what emotion is elicited (see Figure 6-2).

The cognitive, functionalist position on emotion posits that emotions serve an adaptive function. In this view, emotions are considered the mechanisms that signal when events are favourable or harmful to one's concerns. This implies that every emotion hides a concern, a more or less stable preference for certain states of the world. A product will only elicit an emotion if it either matches or mismatches a concern. Why do I feel attracted to an umbrella? Because I have a concern for staying dry. And why am I frustrated when my computer repeatedly crashes? Because I have a concern for efficiency. The process of signalling the personal relevancy of an event is commonly conceptualised as 'a process of appraisal.' An appraisal is a non-intellectual automatic judgement of the meaning of a situation, in which our concerns serve as points of reference.

In chapter 6, the three proposed parameters are explored and discussed. It is examined what concern and appraisal types are relevant for product experience, and how products can act as emotional stimuli. These parameters combine to emotion-specific patterns of eliciting conditions. Because such patterns can support designers in their exploration of the relationship between product design and emotional responses, they are explored in depth in Chapter 7. This exploration was based on Study 9, in which respondents made photos of products in their daily surroundings that elicit distinct emotions. This study resulted in a database of hundreds of anecdotal cases, including both pictures and written rationales that explain the cause of the experienced emotions. It was found that on the one hand a similar product can elicit many different emotions, but on the other hand, the underlying process can be explained with the parameters and their relation as outlined in Chapter 6.

It was hypothesised that a designer can use these parameters to 'get a grip' on the emotional impact of his or her designs. To that end, the [product & emotion] navigator was developed (see Figure 8-3). This educational tool is a virtual product and emotion space that visualises the cases that were obtained in Study 9. As the [p&e] navigator is intended to be a tool of inspiration, the interface was designed to establish interaction that is conceived as challenging, persuasive, and elegant. The interaction is open-ended; it does not have a start, an ending, or a predefined search-

path. One can, for example, use a particular emotion, a particular product, or any of the parameters as a starting point of a [p&e] navigator session.

The design community was actively involved in the development and application of the [p&e] navigator through the organisation of two design workshops. The chapter reports on a workshop in which designers used the parameters to design 'body cleansers' that elicit predefined emotions. Insights drawn from this workshop were used to shape the [p&e] navigator. Next, the tool was applied in a second workshop in which participants designed products that elicit predefined sets of mixed emotions. Both the implications of the model for design practice and the [p&e] navigator's strengths and weaknesses are discussed.

General discussion

In the general discussion, the application possibilities of the results are discussed. The two tools can, for instance, be used to develop emotional design strategies, to define emotional target groups, and to investigate emotional consistency of a company's marketing efforts. In addition, the relationship between product emotions and behaviour (in either purchase, usage, or ownership) is briefly discussed. Recommendations for future research and tool development are reported.

Finally, the implications of the research for design practice are discussed. It is not proposed that to serve humans' well-being, designers should create products that elicit only pleasant emotions. Instead, it may be interesting to design products that elicit 'paradoxical emotions,' that is, positive and negative emotions simultaneously. In experiencing art, it are precisely these paradoxical emotions that we often seek. It may be interesting for designers to investigate the possibilities of designing paradoxical emotions because this may result in products that are unique, innovative, rich, and more challenging or appealing than those that only elicit pleasant emotions.